

AMENDMENT UNDER 37 C.F.R. § 1.111

Appln No.: 10/594,946

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. - 2. (canceled).

3. (currently amended): A road view analyzing apparatus having a camera mounted on a vehicle to photograph a view in front of the vehicle, for analyzing a road view indicated by an image of the view in front of the vehicle photographed by the camera, the road view analyzing apparatus comprising:

an image dividing means for dividing portion which divides the image of the view in front of the vehicle photographed by the camera into a plurality of areas with diagonal lines; and
an analyzing means for separately analyzing content of the image in each of the plurality of areas, wherein

said analyzing means includes:

road view analyzing means for applying portion which applies road analysis processing to an image in a lower area of the plurality of areas; scene analyzing means for applying scene analysis processing to an image in each of left and right areas of the plurality of areas; and background analyzing means for applying background analysis processing to an image in an upper area of the plurality of areas, wherein

for the road analysis processing, said analyzing portion includes:

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a portion which recognizes a white line on a road in accordance with the image in the lower area to calculate an approximate straight line of the white line;
a portion which measures a linear distance of the approximate straight line;
a portion which measures a lane width in accordance with the approximate straight line;
and
a portion which recognizes a road surface state in accordance with the image in the lower area.

4. - 6. (canceled).

7. (currently amended): The road view analyzing apparatus according to claim 3, wherein said analyzing ~~means~~ portion includes:
~~means for setting~~ a portion which sets indexes of a plurality of road characteristics, respectively, in accordance with a result of the road analysis processing;
~~means for setting~~ a portion which sets indexes of a plurality of scene characteristics, respectively, for each of the left and the right areas in accordance with a result of the scene analysis processing;
~~means for setting~~ a portion which sets indexes of a plurality of background characteristics, respectively, in accordance with a result of the background analysis processing;
~~means for calculating~~ a portion which calculates an average value of the indexes of the plurality of road characteristics as road comfortableness;

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~~means for calculating a portion which calculates~~ an average value of the indexes of the plurality of scene characteristics as scene comfortableness on the left and the right for each of the left and the right areas;

~~means for calculating a portion which calculates~~ an average value of the indexes of the plurality of background characteristics as background comfortableness; and

~~means for calculating a portion which calculates~~ an average value of the road comfortableness, the scene comfortableness on the left and the right, and the background comfortableness.

8. (currently amended): The road view analyzing apparatus according to claim 7,

wherein said analyzing ~~means portion~~ includes ~~a document~~ data creating ~~means for creating portion which creates~~ document data including a road characteristic of a maximum value of the indexes of the plurality of road characteristics, a scene characteristic of a maximum value of the indexes of the plurality of scene characteristics, and a background characteristic of a maximum value of the indexes of the plurality of background characteristics.

9. (currently amended): The road ~~seen~~view analyzing apparatus according to claim 7, wherein the plurality of road characteristics are linearity of a road, cleanliness of a road surface, and a breadth of a road width,

the plurality of scene characteristics are a ratio of a forest and a sea, sparseness of advertising boards, and complexity, and

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the plurality of background characteristics are a blue sky ratio, sparseness of signboards, and openness.

10. (currently amended): The road ~~seen~~ view analyzing apparatus according to ~~claim 1~~ claim 3, further comprising:

~~means for judging a portion which judges~~ whether an obstacle is present in the image of the view in front of the vehicle photographed by the camera; and

~~means for activating a portion which activates~~ said image dividing ~~means~~ portion and said analyzing ~~means~~ portion when the obstacle is not present in the image of the view in front of the vehicle.

11. (original): The road view analyzing apparatus according to claim 10, wherein the obstacle is a vehicle.

12. (canceled).

13. (currently amended): A road view analyzing apparatus having a camera mounted on a vehicle to photograph a view in front of the vehicle, for analyzing a road view indicated by an image of the view in front of the vehicle photographed by the camera, the road view analyzing apparatus comprising:

an image dividing means for dividing portion which divides the image of the view in front of the vehicle photographed by the camera into a plurality of areas; and

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an analyzing means for separately analyzing portion which separately analyzes content of the image in each of the plurality of areas,

wherein said image dividing means portion applies white line recognition to the image of the view in front of the vehicle and sets an area up to a white line in the outermost part by the white line recognition as a road area,

and wherein said image dividing portion calculates a moving distance from an amount of change between the image of the view in front of the vehicle photographed by the camera and an image of a view in front of the vehicle photographed temporally earlier than the image and applies a threshold to the moving distance to obtain sectional areas of a scene area and a background area.

14.(canceled).

15. (currently amended): A road view analyzing method of analyzing a road view indicated by an image of a view in front of a vehicle obtained by photographing the view in front of the vehicle, the road view analyzing method comprising:

an image dividing step of dividing the image of the view in front of the vehicle into a plurality of areas with diagonal lines; and

an analyzing step of separately analyzing content of the image in each of the plurality of areas,

wherein said analyzing step includes:

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~~a road view analyzing step of applying road analysis processing to an image in a lower area of the plurality of areas;~~

~~a scene analyzing step of applying scene analysis processing to an image in each of left and right areas of the plurality of areas;~~ and

~~a background analyzing step of applying background analysis processing to an image in an upper area of the plurality of areas,~~

wherein for the road analysis processing, said analyzing step includes:

a step of recognizing a white line on a road in accordance with the image in the lower area to calculate an approximate straight line of the white line;

a step of measuring a linear distance of the approximate straight line;

a step of measuring a lane width in accordance with the approximate straight line; and

a step of recognizing a road surface state in accordance with the image in the lower area.

16. (currently amended): A road view analyzing method of analyzing a road view indicated by an image of a view in front of a vehicle obtained by photographing the view in front of the vehicle, the road view analyzing method comprising:

an image dividing step of dividing the image of the view in front of the vehicle into a plurality of areas with diagonal lines; and

an analyzing step of separately analyzing content of the image in each of the plurality of areas,

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wherein in said image dividing step, white line recognition is applied to the image of the view in front of the vehicle and an area up to a white line in the outermost part by the white line recognition is set as a road area, and

wherein in said image dividing step, a moving distance is calculated from an amount of change between the image of the view in front of the vehicle photographed by the camera and an image of a view in front of the vehicle photographed temporally earlier than the image and a threshold to the moving distance is applied to obtain sectional areas of a scene area and a background area.

17.(new) A road view analyzing apparatus having a camera mounted on a vehicle to photograph a view in front of the vehicle, for analyzing a road view indicated by an image of the view in front of the vehicle photographed by the camera, the road view analyzing apparatus comprising:

an image dividing portion which divides the image of the view in front of the vehicle photographed by the camera into a plurality of areas with diagonal lines; and

an analyzing portion which applies road analysis processing to an image in a lower area of the plurality of areas, scene analysis processing to an image in each of left and right areas of the plurality of areas, and background analysis processing to an image in an upper area of the plurality of areas,

wherein for the scene analysis processing, said analyzing portion includes:

a portion which detects a green ratio and a blue ratio of the image in each of the left and the right areas to estimate a ratio of a forest and a sea;

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a portion which detects a color distribution of the image in each of the left and the right areas; and

a portion which performs fractal dimension analysis for the image in each of the left and the right areas.

18.(new) A road view analyzing apparatus having a camera mounted on a vehicle to photograph a view in front of the vehicle, for analyzing a road view indicated by an image of the view in front of the vehicle photographed by the camera, the road view analyzing apparatus comprising:

an image dividing portion which divides the image of the view in front of the vehicle photographed by the camera into a plurality of areas with diagonal lines; and

an analyzing portion which applies road analysis processing to an image in a lower area of the plurality of areas, scene analysis processing to an image in each of left and right areas of the plurality of areas, and background analysis processing to an image in an upper area of the plurality of areas,

wherein for the background analysis processing, said analyzing portion includes:

a portion which detects a blue ratio of the image in the upper area to estimate a ratio of a blue sky;

a portion which detects a color distribution of the image in the upper area to estimate a background main object; and

a portion which measures a distance to the background main object.

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19.(new) A road view analyzing method of analyzing a road view indicated by an image of a view in front of a vehicle obtained by photographing the view in front of the vehicle, the road view analyzing method comprising:

an image dividing step of dividing the image of the view in front of the vehicle into a plurality of areas with diagonal lines; and

an analyzing step of applying road analysis processing to an image in a lower area of the plurality of areas, applying scene analysis processing to an image in each of left and right areas of the plurality of areas, and applying background analysis processing to an image in an upper area of the plurality of areas,

wherein for the scene analysis processing, said analyzing step includes:

a step of detecting a green ratio and a blue ratio of the image in each of the left and the right areas to estimate a ratio of a forest and a sea;

a step of detecting a color distribution of the image in each of the left and the right areas; and

a step of performing fractal dimension analysis for the image in each of the left and the right areas.

20.(new) A road view analyzing method of analyzing a road view indicated by an image of a view in front of a vehicle obtained by photographing the view in front of the vehicle, the road view analyzing method comprising:

an image dividing step of dividing the image of the view in front of the vehicle into a plurality of areas with diagonal lines; and

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an analyzing step of applying road analysis processing to an image in a lower area of the plurality of areas, applying scene analysis processing to an image in each of left and right areas of the plurality of areas, and applying background analysis processing to an image in an upper area of the plurality of areas

wherein for the background analysis processing, said analyzing step includes:

a step of detecting a blue ratio of the image in the upper area to estimate a ratio of a blue sky;
a step of detecting a color distribution of the image in the upper area to estimate a background main object; and
a step of measuring a distance to the background main object.